

Noviciæ Indicæ IX. *Some additional Papaveraceæ.*—By D. PRAIN.

[Read August, 7th.]

The account of this natural order in the *Flora of British India* (i. 116–119) was published 23 years ago (May 1872). Since that date a number of forms new to the Indian area have been communicated to the Calcutta Herbarium from the various frontiers of the Empire. Some of these require to be added to the Indian Flora, not because they were unknown when the first volume of the *Flora of British India* was published—a few of them as a matter of fact are included in the *Flora Indica* published by Drs. Hooker and Thomson in 1855, which included in its purview the area beyond the north-west frontier comprising Beluchistan and Afghanistan that is excluded from the scope of the later work—but owing to extension of Indian territory towards the north-west during the past quarter of a century. In the present paper it is proposed to provide diagnoses of those forms in as nearly as may be the style of the diagnoses in the *Flora of British India*; to obviate the possibility of confusion between the forms now described and those given in the *Flora*, keys have been prepared showing the relationships of *all* the Indian species in each genus.

To assure himself of the probable validity of the species here proposed as new, and of the accuracy of the nomenclature of those previously described, the writer has compared examples of each with the material of the order contained in a number of European collections. He has also had the advantage of the use of the material in Herb. Saharaupur kindly placed at his disposal by Mr. Duthie, that in Herb. Zürich kindly lent by his friend Prof. Schinz and that in the private collection of Mr. C. B. Clarke kindly lent by its owner. For facilities in consulting the public Herbaria at Kew, the British Museum, Paris and Geneva, the writer has to thank Mr. Dyer, Mr. Carruthers, M. Ed. Bureau, and Dr. J. Mueller respectively; while for permission to study the material in their magnificent private collections, he is deeply indebted to M. Casimir de Candolle and M. Barbey-Boissier of Geneva, and to M. Drake del Castillo of Paris. And for assistance and advice most ungrudgingly given during his study of these Indian species, the writer would wish to thank many friends, but more especially M. Casimir de Candolle, Geneva; M. Ad. Franchet, Paris; Dr. Batalin, St. Petersburg; and Surgn.-Capt. Cummins, Army Medical Staff.

The limitation of genera, at all times a subject of discussion, is particularly perplexing among Thalamifloral orders; the difficulties that beset the student of *Papaveraceæ* in particular are many and great. A complete review of these difficulties could only be appropriate

in a revision of the order as a whole. Still even in a partial and more or less cursory review like the present, it is impossible to avoid an allusion to some of them; a brief note is therefore added to the systematic account of each genus.

### PAPAVERACEÆ.

*Key to the Indian genera (including those newly reported).*

- \* Capsules opening by short valves or pores:—
  - † Stigmas radiating on a sessile disc; (sepals 2, petals 4) 1. PAPAVER.
- † † Stigmas at the top of a distinct style:—
  - ‡ Stigmas discrete above, patent; sepals 3, petals 6,... 2. ARGEMONE.
  - ‡ ‡ Stigmas concrete throughout, decurrent; sepals 2, petals 4 in 2 pairs, or 5-9 in an imbricate spiral 3. MECONOPSIS.
- \* \* Capsules dehiscing throughout their length; (sepals 2, petals 4):—
  - † Stigmas sessile:—
    - ‡ Stigmas radiating; valves 3-4, rarely 2; fruit without dissepiment ... 4. ROEMERIA.
    - ‡ ‡ Stigmas prolonged as 2 horizontal arms; fruit with a pseudo-replum in which the seeds are partially embedded ... 5. GLAUCIUM.
  - † † Stigmas at the top of a distinct style:—
    - ‡ Stigmas concrete throughout, valves 3-6 ... 6. CATHCARTIA.
    - ‡ ‡ Stigmas discrete above, valves 2 ... 7. CHELIDONIUM.

### 1. (1.) PAPAVER LINN.

*Key to the Indian species (incorporating the new forms).*

- \* Perennial; scapes simple leafless; flowers orange-yellow; (filaments subulate; capsule hispid; whole plant hirsute) ... 1. *P. nudicaule*.
- \* \* Annuals; stems branching leafy; flowers scarlet, purple or pink:—
  - † Stem-leaves not amplexicaul; plants usually hispid:—
    - ‡ Capsules hispid; leaves 2-3-pinnatifid; (flowers scarlet with dark purple eye):—
      - § Sepals obtuse; filaments dilated upwards ... 2. *P. hybridum*.
      - § § Sepals with horn-like subapical processes; filaments filiform ... 3. *P. pavinum*.
    - ‡ ‡ Capsules glabrous; leaves 1-2-pinnatifid; (filaments filiform):—
      - § Capsules subglobose stalked; lobes of disc overlapping ... 4. *P. Rhæas*.
      - § § Capsules oblong sessile; lobes of disc distinct:—
        - ¶ Lobes of disc plane and separated by shallow sinuses ... 5. *P. dubium*.
        - ¶ ¶ Lobes of disc strongly ridged and separated by deep divisions (disc stellate) ... 6. *P. turbinatum*.

† † Stem leaves clasping; plants glabrous and glaucous;  
(capsules glabrous):—

‡ Capsules obovate-oblong, sessile; filaments subulate; small plants 6–12 in. high ... 7. *P. Decaisnei*.

† † Capsules globose, stalked; filaments dilated upwards; tall plants 2–4 feet high ... 8. *P. somniferum*.

The genus *Papaver* is hardly an Indian one; *P. somniferum* is only known as a cultivated plant while, except in a cultivated form, *P. Rhœas* is hardly known in India. *P. hybridum* is a species widespread in the Mediterranean and Oriental regions; *P. pavoninum*, *P. turbinatum*, *P. Decaisnei* are three species common in the Orient (Asia Minor, Syria, Persia, Afghanistan and Beluchistan): all four species are therefore Indian only because, along its extreme north-west border, the Indian Empire includes a fringe of their natural geographical area. Of the remaining two the Alpine species, *P. nudicaule*, occurs only in the Hindu-Kush and Karakoram and is thus not even truly Himalayan, while the temperate species *P. dubium* is a mere corn-field weed. Even that is limited to the North-West Himalaya, where it occurs in a form which extends from Southern Russia through all the intermediate countries to the area indicated.

1. (1.) *PAPAVER NUDICAULE* Linn. *Sp. Pl.* ed. i., i. 507 (1753).

VAR. *rubro-aurantiacum* Fisch. ex DC. *Syst. Veg.* ii. 70 (1821); Sims, *Bot. Mag.* t. 2344 (1822); DC. *Prodr.* i., 118 (1824). *P. croceum* Ledeb., *Flor. Altaic.* ii. 271 (1830). *P. alpinum* VAR. *croceum* Fisch. & Mey. *Ind. Sem.* iii, 44 (1837); Ledeb., *Flor. Ross.* i., 87 (1842). *P. nudicaule* VAR. *croceum* Elkan, *Monogr. Papav.* 17 (1839); Walp. *Rep.* i. 111 (1842). *P. nudicaule* H. f. & T., *Flor. Ind.* 249 (1855) Boiss. *Flor. Orient.* i. 107 (1867); H. f. & T. *Flor. Brit. Ind.* i. 117 (1872).

All the Indian wild specimens are referable to this particular variety which has orange-yellow flowers, dark coloured hairs on the scapes and dark-coloured setæ on the capsules. The geographical area of this variety extends from Afghanistan, Northern Kashmir and Western Tibet, through Soongaria and along the Altai range to Mongolia and Northern China.

A remarkably fine cultivated form of this plant is to be found in gardens in South-Eastern Tibet and in the Chumbi valley. The flowers are sometimes over 3 inches in diam. and though occasionally yellow, are usually dark purple and look very much like those of *P. Rhœas*. Some of the Tibet specimens are partially double-flowered: these were collected in the province of Tsang and communicated to Calcutta by the Lama Ujyen Gyatsko. The Chumbi specimens were obtained by one of Dr. King's Lepcha collectors. It is somewhat remarkable that we have never yet succeeded in obtaining seeds of this plant which might be known as *P. nudicaule* VAR. *grandiflora*. Apparently it does not occur in gardens in Sikkim.

2. (2.) *PAPAVER HYBRIDUM* Linn.

3. (—.) *PAPAVER PAVONINUM* Schrenk ex Fisch. & Mey. in *Enum. Pl. nov.* Schrenk 64 (1842); leaves pinnatipartite, segments oblong-

linear incised-dentate sparingly hispid, filaments filiform, sepals hirsute with a dorsal conical process under the tip; capsule ovate setose aculeate, stigma convex rays 4-6. *O. A. Mey.* in *Ind. Sem.* ix. 35, 82 (1843); *Bunge, Rel. Bot. Lehm.* 16 (1847); *Stscheg. Bull. Soc. Mosc.* (1854) i., 151; *Trautv. Bull. Soc. Mosc.* (1860) i. 91; *Regel & Herder, Bull. Soc. Mosc.* (1866) iii. 90; *Boiss. Flor. Orient.* i. 116 (1867); *Osten-Sacken & Rupr. Sert. Tianschan.* 38 (1869); *Regel & Herder, Bull. Soc. Mosc.* (1870) ii. 248. *P. hybridum Kar. & Kir. Bull. Soc. Mosc.* (1842) i. 141 non *Linn.* *P. cornigerum Stocks, Lond. Journ. Bot.* iv. 142 (1852); *H. f. & T. Flor. Ind.* 250 (1855); *Walp. Ann.* iv. 173 (1857).

PANJAB: Peshawar, *Vicary! Stewart!* SCINDE: *Stocks!* BRITISH BELUCHISTAN: near Quetta, *Sanders! Duke! Lace! Duthie! Appleton!* DISTRICT. Throughout Beluchistan, Afghanistan, Turkestan and Soongaria.

Annual, stems slender sparingly branched; leaves, flowers and habit very like those of *P. hybridum*; the capsules however are smaller while the horned sepals and the filiform filaments at once easily distinguish it.

4. (3.) *PAPAVER RHÆAS Linn. Sp. Pl.* ed. i., i. 507 (1753).

VAR. *typica*; stigmatic rays 8-12.

This is an extremely rare plant in India; the only undoubted specimens the writer has seen were collected by Sir D. Brandis in Chamba, Panjab Himalaya (*Brandis n.* 4336!). Some specimens that may also be referable to genuine *P. Rhæas* were collected in Kashmir by Dr. T. Thomson. These, however, in spite of the smaller number of their stigmatic rays, look more like a reversion to type, after "escape," of the following variety, than like the European plant.

VAR. *latifolia*; stigmatic rays 12-20. *Papaver Rhæas* VAR. *latifolia Ham. Mss.* in *Wall. Cat.* n. 8119 (1830). *P. Hookeri Baker* in *Bot. Mag.* cix. t. 6729 (1883). The SHIRLEY POPPY: *Journ. of Horticult.* (1886) p. 367, f. 55.

Cultivated in Indian gardens from SCINDE, *Stocks!* to the NORTH-WEST PROVINCES, *Royle! Falconer! Thomson! King!* and LOWER BENGAL, *Hamilton! Hooker!*

Annual, branched, 3-4 ft. high, covered with spreading hispid hairs; stem as thick as little finger at base, branches erect and ascending, flowering copiously; flowers 2-4 in. across; petals in unequal pairs, crenulate, pale rose to bright crimson, base wedge-shaped with diffused white to blue-black spot; capsule  $\frac{1}{2}$ - $\frac{3}{4}$  in. diam., shortly stalked, crenations of disk rounded overlapping.

From this description, which applies to the cultivated plant, it will be seen that there is hardly room for doubt that we have here to deal with only a form of *P. Rhæas*. The distinguishing botanical feature is the larger number of stigmatic rays; on the strength of this character Mr. Baker has proposed specific rank for the plant. This it certainly does not deserve and from the existence of



a very intermediate state in Kashmir it is doubtful if its separation even as a variety is altogether valid. It is however very easy, even in the Herbarium, to distinguish this plant from cultivated forms of *P. Rhæas* proper introduced from Europe which grow with a luxuriance that equals that of *var. latifolia* itself. The form seems to have originated in Indian gardens and is supposed to have only recently been introduced to European culture. This is however not quite exact, for the Poppy now known as the Shirley Poppy, which seems to be undoubtedly the Indian *P. Rhæas var. latifolia*, has been in continuous cultivation in Scotland for over half a century.

Occasional references in Indian writings to the presence of *P. Rhæas* must be discounted. In the majority of cases *P. dubium*, not infrequently *P. turbinatum*, is the species intended; the idea having become prevalent that the plant which is really *P. Decaisnei* is *P. dubium*, not unnaturally the casual observer supposes that what is really *P. dubium* must be *P. Rhæas*.\*

5. (4.) *PAPAVER DUBIUM* Linn. *Sp. Pl.* ed. i., ii. 1196 (1753.).

*var. glabrum* Koch, *Syn.* 30 (1837). *P. dubium var. lævigatum* Elkan, *Monogr. Papav.* 25 (1839); *H. f. & T. Flor. Ind.* 250 (1855); *Walp. Ann.* iv. 176 (1857). *P. lævigatum* M. Bieb. *Flor. Taur. Cauc.* iii. *Suppl.* 364 (1819); *DC. Syst. Veg.* ii. 78 (1821); *Prodr.* i. 119 (1824); *Spreng. Syst.* ii. 569 (1825); *Reichb. Pl. Crit.* iv. 41. t. 533 (1826); *C. A. Mey. Verzeichn. Pfl. Cauc.* 175 (1831); *Boiss. Flor. Orient.* i. 114 (1867). *P. glabellum* Stev. ex *DC. Syst. Veg.* ii. 78 (1821). *P. glabrum* Royle. *Ill.* 67 (1839).

All the Indian specimens of *P. dubium* are referable to this variety which is distinguishable from the type only by being subglabrous with the few setæ on the scape, the lower surface of the leaves and the sepals, adpressed. In South-Eastern Europe intermediate forms connecting this with true *P. dubium* are plentiful; no such connecting forms and no examples of true *P. dubium* occur in India. The geographical area of this variety extends from Southern Russia, the Caucasus and Georgia through Eastern Asia Minor, Armenia and Persia to Northern Beluchistan, Afganistan and the North-West Himalaya as far eastward as Garhwal. The figure by Reichenbach quoted above (*Pl. Crit.* 533) is made from Bieberstein's original examples collected near Odessa; that figured under the same name by the same author in *Flor. German.* t. 4478 b. is not this plant.

6. (—) *PAPAVER TURBINATUM* DC. *Syst. Veg.* ii. 84 (1821); leaves 1-2-pinnatisect, filaments filiform, capsule elliptic-oblong glabrous, stigma 6-10-rayed crenations of disc deeply cut, widely separated and ridged. *DC. Prodr.* i. 120 (1824); *Boiss. Flor. Orient.* i. 144 (1867). *P. macrostomum* Boiss. & Huet. in *Sched. Pl. Huet.* (1855); *Boiss.*

\* In a circular regarding sheets missing from the Wallichian type Herbarium which is preserved in the rooms of the Linnean Society of London n. 8119 is noted as being there unrepresented. This is a mistake; the specimen is present and in good condition; it has been overlooked owing to its having been inadvertently glued down along with n. 8120.

*Flor. Orient.* i. 115 (1867). *P. Rhœas* Wall. *Cat.* n. 8120 (1830) *nec* Linn. *P. Rhœas* ? *H. f. & T. Flor. Ind.* 251 (1855).

KASHMIR: common, *Falconer!* *Thomson!* *Aitchison!* at Romoo, 6000 feet, *Clarke* n. 28543! at Srinagar, 5300 feet, *G. Gammie!* cultivated or an escape. BENGAL: cultivated, *Hamilton!* DISTRIB. Yarkand, Afghanistan, Persia and Armenia.

Annual, branched, 1-2 ft., scapes with adpressed hairs; leaves, habit and general appearance of *P. dubium* var. *glabrum* (*P. lævigatum* M. Bieb.) and of *P. Rhœas* var. *commutatum* (*P. commutatum* Fisch. and Mey.) but easily distinguished from all forms of *P. Rhœas* by the shape of its capsule which is like that of *P. dubium*, and from all forms of *P. dubium* by its deeply lobed, star-like disc with ridged crenatures. *Petals* purple with a dark basal eye; *capsule*  $\frac{5}{8}$  in. -1 in. long.

The presence of this species in India has been overlooked owing to its having been mistaken when in flower for *P. Rhœas* and when in fruit for *P. dubium*. Of its specific position there is not however any doubt: the Indian plant is exactly that which forms the type of *P. macrostomum* Boiss. and Huet. Since the publication of the *Flora Orientalis* however very large suites of specimens of *P. macrostomum* have been reported. These show that, like its allies *P. dubium* and *P. Rhœas*, this is an extremely variable plant and a careful study of all the specimens in M. Boissier's own Herbarium, in Herb. Kew and in Herb. Paris has convinced the writer that *P. macrostomum* is not specifically distinct from *P. turbinatum*, the solitary specimen of which has the same capsule and disc and only differs in foliage and in stature from the original specimens of *P. macrostomum*. Since the latter species was proposed all the necessary intermediates have been reported again and again.

8. (—) PAPAVER DECAISNEI *Hochst. & Steud. in Schimp. Pl. Arab. eaz.* n. 125 (April 1836); leaves pinnatipartite, segments lanceolate-dentate, cauline rounded at base and amplexicaul; capsule ovate-oblong glabrous, stigma 5-7-rayed. *Boiss. Flor. Orient.* i. 115 (1867). *P. turbinatum* *Fresen. Mus. Senkenb.* 173 (1834) *non* DC. *Papaver* sp. nov. *Decaisne, Fl. Sinai.* 45 (1835). *P. dubium* var. *Decaisnei* *Elkan, Monogr. Papav.* 26 (1839). *P. dubium* var. *lævigatum* *H. f. & T. Flor. Ind.* 250 (1855) *in part*; *Aitchison. Journ. Linn. Soc.* xviii. 32 (1851) *in part. non* *Elkan.*

PANJAB: Rawal Pindi, *Aitchison* n. 44! Trans.-Indus dist., *Stewart!* SCINDE: *Stocks!* DISTRIB. Beluchistan, Afghanistan, Persia, Arabia, S. Syria.

A glaucescent glabrous annual or rarely a biennial 6-12 in. high, with very short stems and long peduncles; *flowers* 1 in. diam., sepals glabrous, petals obovate rose purple with dark eye; anthers shortly oblong.

The Eastern limit of the geographical area of this species lies just inside the frontier of the Indian Empire along its whole north-west border. The species has been associated by Elkan and by most Indian botanists with *P. dubium* var. *lævigatum*, and the resemblance is indeed often very great. It is however easily distinguished by its perfectly glabrous glaucous appearance and by its stem-leaves which

clasp at the base. Some specimens collected by Dr. Stapf in Persia show that occasionally the species may be distinctly biennial.

### 9. (5.) *PAPAVER SOMNIFERUM* Linn.

It is of interest, in connection with the theory that the people of China first learned the use of Opium and first obtained the Opium Poppy itself from India, to find from a careful examination of specimens of the Poppy cultivated for Opium in China that are preserved in the magnificent botanical collections of London, Paris and Geneva, that this Poppy belongs to a race quite distinct from the Indian plant, more nearly allied to the form of *Papaver somniferum* that produces Persian Opium than to the form that is cultivated in Hindustan. The specimens referred to come from Yunnan, Szechuen, Hunan and Hupeh. Curiously the only Chinese specimens of *Papaver somniferum*, cultivated for Opium, that are indistinguishable from the Indian race, which the writer has seen, are in Herb. Calcutta. They were communicated by Fortune in 1853 and are from the Eastern province of Che-kiang, not from Central or South-Western China where the Opium Poppy is chiefly cultivated.

### 2. (1\*) *ARGEMONE* LINN.

#### 1. *ARGEMONE MEXICANA* Linn.

Four of the gatherings issued by Wallich under this name (*Cat. Lith.* n. 8126) are really this species, the fifth (8126 E. from Kamaon) is the yellow-flowered *Meconopsis* described by Hooker and Thomson as *M. robusta*.

### 3. (2.) *MECONOPSIS* VIGUIER.

*Key to the Indian species (incorporating the new forms.)*

\* Stems, leaves, sepals and ovaries prickly; stigmas pyramidal (flowers pale purple, papaveroid, (*i.e.*, petals 4) exceptionally sanguinarioid, (*i.e.*, 5-8):—

† Stems not leafy, radical leaves many persisting; scapes radical 1-fl'd. or pseudo-cymose from agglutination of scapes, pedicels not or very rarely bracteate, torus distinctly enlarged; leaves lanceolate (entire or, rarely, acutely dentate; capsules densely aculeate short oblong or obovate, twice as long as style)... 1. *M. horridula*.

† † Stems leafy, radical leaves few vanishing; flowers in racemose cymes with bracteate pedicels; torus not expanded; leaves oblong:—

‡ Leaves irregularly pinnatifid; capsules densely aculeate, short oblong or obovate, twice as long as style ... 2. *M. aculeata*.

‡ † Leaves with sinuate or subentire margins; capsules sparsely aculeate long narrowly obconic, five times as long as style ... 3. *M. sinuata*.

\* \* Stems, leaves, sepals and ovaries without prickles; stigmas capitate entire or (in *M. primulina*) 2-lobed:—

† Stems leafy:—

‡ Stems often branching, cymes many-flowered rare-

ly simple; flowers papaveroid, (*i.e.*, petals 4);  
(tall tomentose or hirsute plants, radical leaves  
few, cauline many all scattered; capsules setose):—

§ Capsules ovate 8-11-valved, style short much  
thickened at base:—

¶ Flowers yellow:—

×  
× Stems and leaves sparsely crinite

at length glabrescent; cauline  
leaves pinnatifid, lobes rounded  
acute; sepals sparsely crinite  
capsule with few adpressed setae

4. *M. robusta.*

× ×  
× × Stems, leaves and sepals hispidly

hairy and densely softly tomen-  
tose; cauline leaves coarsely  
dentate; capsule densely covered  
with ascending setae and close  
stellate pubescence ...

5. *M. paniculata.*

¶ ¶ Flowers white (stems, leaves and sepals  
hispidly hairy and densely softly tomen-  
tose; cauline leaves finely toothed) ...

6. *M. superba.*

§ § Capsules shortly cylindric 5-7-valved, style  
long slender throughout:—

¶ Flowers dark fuscous-purple; stems, leaves  
and sepals sparsely hirsute with long  
hairs ...

7. *M. napaulensis.*

¶ ¶ Flowers pale blue-purple; stems, leaves  
and sepals softly densely puberulous ...

8. *M. Wallichii.*

‡ ‡ Stems always simple, cymes few-fl'd. simple; flowers  
sanguinarioid, (*i.e.*, petals 5-9); (purple):—

§ Radical leaves few vanishing; cauline close-  
set on a short stem (pseudo-radical) scapes  
long; small glabrous or sparsely setose  
plants with narrowly ovoid glabrous capsules  
and 2-lobed stigmas ...

9. *M. primulina.*

§ § Radical leaves many persisting, cauline few  
the lower scattered the upper whorled; pedicels  
short; tall softly hairy plants with linear-  
oblong sparsely hispid capsules ...

10. *M. grandis.*

† † Stems not leafy scapes numerous radical, (flowers  
purple, radical leaves many persisting):—

‡ Leaves simple dentate, scapes long, capsules linear-  
oblong sparsely hispid; large softly hairy plants  
with sanguinarioid flowers, (*i.e.*, petals 5-8) ...

11. *M. simplicifolia.*

‡ ‡ Leaves 2-3-pinnate; scapes short, capsules shortly  
obovate glabrous; dwarf perfectly glabrous plants  
with sub-papaveroid flowers, (*i.e.*, petals 4 or 5) ...

12. *M. bella.*

Species 1-3 constitute the group *Aculeatæ* extending throughout



the Himalayas and Tibet and occurring in Szechuen and Yunnan; species 4-8, the group *Robustæ* peculiar so far as is known to the central and Eastern Himalaya; species 9 belongs to the group *Primulinæ* of which the remaining known members inhabit Szechuen and Yunnan; species 10 and 11 to the *Grandes* of which the three other known members occur in Kansu, North Tibet, Szechuen and Yunnan; species 11 is the only representative of a very distinct group the *Bellæ*.

The genus includes 2 other groups not represented in India; viz., the *Chelidonifoliæ* with 2 Chinese and 1 Western European species and the *Anomalæ* with 2 Californian species.

Unlike *Papaver*, *Meconopsis* is a characteristically Himalayan genus since 12 species, or nearly one-half of the known forms have been reported from the Himalayan region. Only two occur in the Western Himalaya; one, *M. aculeata*, extending from Garhwal and Kunawar to Kashmir, overlaps the eastern fringe of the area occupied by *Papaver*; the other, *M. robusta*, which is perhaps only a condition, and certainly is at most the representative, of the more widely distributed *M. paniculata*, is confined to Kamaon. It is only when we reach the region from Central Nepal eastward that we come upon the main body of the genus. In Central Nepal we find three species, *M. paniculata*, *M. napaulensis* and *M. simplicifolia*; these we find in Eastern Nepal and Western Sikkim along with five other forms; *M. Walli-chii*, which seems only a local manifestation of *M. napaulensis*; *M. sinuata*, a similar local manifestation of *M. aculeata*; *M. grandis*, a local manifestation of *M. simplicifolia*; *M. horridula*, a somewhat variable species widely extended throughout Tibet and Western China of which *M. aculeata* and *M. sinuata* alike appear to be derivatives; lastly, the exceedingly distinct *M. bella*. Somewhat further east we come upon *M. superba*, a very handsome species that would however appear to be hardly more than a local representative of *M. paniculata*; and *M. primulina*, a near ally, and perhaps only the local representative of a Szechuen species, *M. Henrici*.

The region which includes Western and Central China from Kansu to Yunnan and Hupeh is quite as rich in species as the explored Eastern Himalaya. In Kansu there are three species; *M. quintuplinervia* and *M. punicea* extending to Northern Tibet, and *M. integrifolia* extending to Szechuen and Yunnan; all three are near allies of the Sikkim *M. simplicifolia*. In Szechuen we find six; one species, confined to the province, is *M. Henrici* nearly allied to the Himalayan *M. primulina*; another is a form of the Tibeto-Himalayan *M. horridula*; a third is apparently a form of the Sikkim *M. sinuata*; a fourth is *M. integrifolia* already discussed; the last two are species which are very distinct from the rest and which have no Himalayan representative, but which are very closely allied to each other; these are *M. chelidonifolia*, confined to Szechuen, and *M. Oliveriana* extending also to Hupeh. In Yunnan, besides *M. integrifolia* and a form of the nearly ubiquitous *M. horridula* there are two species of the *Primulinæ* group, *M. lancifolia* and *M. Delavayi*. \* These two species, originally tentatively referred by M. Franchet, in the absence of ripe fruit, to *Cathcartia*, are, as their distinguished author has

\* *Meconopsis lancifolia* Franchet MSS. in *Herb. Paris*. *Cathcartia lancifolia* Franchet Bull. Soc. Bot. Fr. xxxii. 391 (1886). *Meconopsis Delavayi* Franchet MSS. in *Herb. Paris*. *Cathcartia Delavayi* Franchet, Bull. Soc. Bot. Fr. xxxii. 390 (1886).

most obligingly pointed out to the writer, true *Meconopsis*, the ripe capsules recently received having valves that are only partially dehiscent. Still another possible species is the plant described by M. Franchet as *M. betonicaefolia*. It may well be a *Meconopsis* but the fruit is not ripe and from its evident close affinity to two Himalayan species that seem undoubtedly referable to *Cathcartia* this may also prove to be better placed in that genus. From Hupeh the already mentioned *M. Oliveriana*\* is the only species as yet recorded; like *M. chelidoniifolia* it also occurs in Szechuen.

From what has been said it will be clear that the home of *Meconopsis* is the conjoint Himalo-Tibetan and Tibeto-Chinese regions. But while this is the case there are three species that do not occur within this area and that exhibit a distribution which, even for outliers, is remarkable and peculiar. One species *M. cambrica*, that on which Viguiier originally founded the genus, is confined to Western Europe, where it extends from Portugal to Wales, Cumberland and Strath-Clyde, thus overlying the western fringe of the *Papaver* area as *M. aculeata* overlies its eastern fringe. And strangely enough its nearest allies in the genus would seem to be *M. chelidoniifolia* and *M. Oliveriana*—precisely the species from which it is furthest separated geographically. The two remaining species *M. crassifolia* and *M. heterophylla* occur in Western America. These are altogether anomalous in having valves which dehisce like those of *Papaver* by short subquadrate pores and in having their stigmatic lobes discrete as in *Chelidonium* or in *Argemone*. More disconcerting still is the fact that in the same area there occur two true *Papavers*, *P. californicum*, and *P. Lemmoni*, the former with a perfectly normal disc, the latter with an umbonate one like *Papaver stylatum*, while all four species are so very nearly related that it is only by an examination of their ripe capsules that they are to be definitely separated. It is not therefore surprising that so careful an observer and so great an authority on Californian species as Prof. E. Greene proposes to treat all four as congeneric. Whether, as he proposes, all should be treated as *Papavers* is a matter

\* *Meconopsis Oliveriana* Franchet & Prain MSS. in *Herb. Paris.* and in *Herb. Kew.* Stems tall copiously branched, setulose below, glabrous above; leaves numerous, lower and middle shortly petioled sparingly strigose on both surfaces as are the upper sessile somewhat amplexicaul, ovate-oblong pinnatifid; segments 1-2-jugate petiolulate ovate pinnatifid, lobes rounded obtuse, terminal segment deeply 3-lobed; peduncles numerous slender and sepals glabrous; flowers solitary at the end of stem and of the many axillary always leafy branches; capsule long cylindric 4-5-valved, glabrous; placentas nerviform.

CHINA: Szechuen, Tchen-kéou-tin, *Farges* n. 390! Hupeh; *Henry* n. 6863!

Stems erect 2-3 ft. high, as thick as a swan's quill at base, flowers 8-12 terminal; buds globose; style very short and thick; capsule including style  $1\frac{1}{2}$  in. long,  $\frac{1}{4}$  in. across; rootstock villous.

This species so closely resembles in all its vegetative characters *M. chelidoniifolia* Franchet, that at first it is hard to believe that they can be distinct. The fruit is however totally different; in *M. chelidoniifolia* the capsule is short, ovate,  $\frac{3}{4}$  in. long, and  $\frac{1}{2}$  in. across, the style is distinct and slender and the placentas are deeply intruded as they are in the true *Poppies*. Another difference is in the colour of the petals which seem, judging from dried specimens in *Herb. Paris.* to be purplish; certainly they are not bright yellow as in *M. chelidoniifolia*. Both species much resemble *Cathcartia villosa*.

that requires, in the writer's opinion, further consideration. It is true that in the genus *Papaver*, as at present understood, are included a number of forms nearly allied to *P. armeniacum* which have valves that dehisce like *Meconopsis* valves and have stigmas of the normal *Meconopsis* type, so that they differ from *Meconopsis* only in the absence of any style. But it does not seem necessary on this account to propose that we should return to the view adopted by Linnæus as regards the European, and by Don as regards the Himalayan species, and speak of all the *Meconopses* as *Papavers*.

Another point of interest in the genus is the number of petals. This is given in most systematic treatises as 4. In the three species *M. cambrica*, *M. chelidoniifolia*, *M. Oliveriana*, forming the *Chelidoniifoliæ*, this is the case, as it is in the *Anomalæ* (*M. heterophylla*, *M. crassifolia*) and in the *Robustæ* (*M. robusta*, *M. paniculata*, *M. superba*, *M. napaulensis*, *M. Wallichii*). Among the *Aculeatæ*, *M. aculeata* and *M. sinuata* would appear to be always 4-petaled, but with *M. horridula* the exceptions are quite as frequent as the rule. In *M. bella* which may have 4 petals we usually find 5; while in two groups—the *Grandes* (*M. simplicifolia*, *M. quintuplinervia*, *M. punicea*, *M. grandis*, *M. integrifolia*) and the *Primulinæ* (*M. Henrici*, *M. primulina*, *M. lancifolia*, *M. Delavayi*)—we by no chance ever find 4 petals; in all these species we find, as in *Sanguinaria*, 5-8 or 9 petals imbricately spirally arranged. Yet there is no doubt, in spite of this divergence from the characters usually ascribed to the genus that these species are genuine *Meconopses*.

§ 1. *Aculeatæ*. *Stems, leaves, sepals and ovaries prickly; stigmas pyramidal; flowers pale purple, usually Papaveroid, i.e., with 4 petals; (occasionally in M. horridula var. typica and usually in M. horridula var. racemosa with petals 5-8).*

#### 1. (2.) *MECONOPSIS HORRIDULA* H. f. & T.

*VAR. typica*; scapes radical one-fl'd; leaves membranous entire. *M. horridula* H. f. & T. *Flor. Ind.* 252 (1855); *Walp Ann.* iv. 171 (1857). *Flor. Brit. Ind.* i. 118 (1872).

SIKKIM: Kongra-Lama, Bomtso and Kan-ka-la, 14-17000 ft. abundant, *Hooker!* Kan-kra-la and Donkia, *G. Gammie! Cummins!* CHUMBI: at Te-ling, *Dungboo!* *DISTRIB.* Central Tibet (*Rockhill!*) and South-Eastern Tibet (*Thorold! King's Collectors!*)

*VAR. racemosa*; some or all of the scapes agglutinated to form a leafless grooved stem with pseudo-racemose inflorescence and bractless pedicels; leaves membranous entire or (rarely) dentate. *M. racemosa* *Maxim. Bull. Acad. Petersb.* xxiii. 310 et *Mel. Biol.* ix. 713 (1876); *Forbes & Hemsl. Journ. Linn. Soc.* xxiii. [*Ind. Sinens.* i.] 34 (1886); *Maxim. Flor. Tangut.* i. 36. t. 9. f. 1-6 et t. 23. f. 26 (1889).

SIKKIM: Ta-ne-gang, Gia-gong and near Cho-la, *King's Collectors!* Lachung, *Dungboo!* Tankra-la (specimens with deeply dentate leaves), *G. Gammie!* CHUMBI: Sham-chen, *Dungboo!* Ta-Chey-Kung, *King's Collectors!* *DISTRIB.* North Tibet (*Przewalski!*) Central Tibet (near Lhasa, *Dungboo!*) Northern Szechuen (*Potanin!*)

It is impossible to sustain the specific rank claimed for this form. In the northern and central portions of the area inhabited by the species the two forms come from adjacent districts. In Sikkim, the extreme southern limit of its geographical distribution, the two forms grow intermixed; all our Calcutta gatherings, as well as Hooker's original ones, show transitions from the one to the other.

[*VAR. rudis*; stems like those of *VAR. racemosa* but taller, thicker, hardly grooved and leafy at the base with the lower pedicels bracteate; leaves very thick with subsinuate margins and very sparsely prickly as are the sepals and stems; capsules small, hardly exceeding in diam. the much expanded torus. *M. racemosa* Franchet, *Bull. Soc. Bot. Fr.* xxxiii. 38 (1886); *Plant Delavay*. 41 (1889) *via Maxim.*

YUNNAN: Li-kiang, *Delavay*!

This plant, united by M. Franchet with Mr. Maximowicz' *M. racemosa*, certainly differs variately in the points noted.]

The suggestion made in the *Flora Indica* and again in the *Flor. Brit. Ind.* that *M. horridula* may after all be no more than an Alpine form of *M. aculeata* has not, so far, been supported by the collection of the necessary intermediate forms. On the contrary the facts of distribution among the members of the *Aculeatæ* group point decidedly in the opposite direction. Although *M. aculeata* has capsules remarkably like those of *M. horridula* its torus is not thickened, its leaves are widely dissimilar, its stem is leafy and its pedicels are bracteate.

2. (3.) *MECONOPSIS ACULEATA* Royle, *Ill.* 67. t. 15 (1839); *Walp. Rep.* i. 110 (1842); *H. f. & T. Flor. Ind.* 253 (1855); *Walp. Ann.* iv. 171 (1857); *Klotzsch, Reis. Pr. Waldem.* 129 (1862); *Hook. Bot. Mag.* t. 5456 (1864); *H. f. & T. Flor. Brit. Ind.* i. 118 (1872). *M. Gulielmi-Waldemari* Klotzsch, *Reis. Pr. Waldem.* 129. t. 36 (1862); *Walp. Ann.* vii. 86 (1868). *M. napaulensis* Jacquem. *MSS. in Herb. Paris*; *Falc. MSS. in Herb. Saharanpur*; *nec M. napaulensis DC. Wall. Cat.* n. 8122!

It is not possible to accord even varietal rank to the form figured and described by Klotzsch as *M. Gulielmi-Waldemari*.

3. (—.) *MECONOPSIS SINUATA* Prain; prickly, stem leafy, leaves oblong-lanceolate, flowers pale blue-purple; capsules long narrowly obconic, sparsely prickly.

*VAR. typica*; leaves obtuse with sinuate margins.

SIKKIM: Patang-la, Pey-kiang-la and Ney-go-la, *King's Collectors*! Jongri, *G. Gammie*! BOOTAN: Dichu Valley, *Cummins*!

[*VAR. Prattii*; leaves subacute serrate or subentire.

SZECHUEN: near Tachienlu, *Pratt.*, n. 525!]

*Rootstock* stout, fusiform; *stems* 1-3 ft. smooth except for the scattered prickles. *Leaves* 4-7 in., long petioled, upper cauline sessile. *Cymes* few-fl., *flowers* 2-3 in. diam., *pedicels* bracteate slender fastigiate in fruit, prickly; *petals* 4. *Capsule* 1½-1½ in. sparsely prickly, ultimately subglabrous; *style* ¼-½ in.; *stigma* small. *Seeds* scaberulous hilum slightly crested.

This species has much the habit of *M. aculeata* of which it appears to be in



the Eastern Himalaya the representative form. It has however different leaves and a totally different capsule with a much smaller stigma. The plant here described as VAR. *Prattii* has leaves quite like those of *M. horridula* VAR. *racemosa* though of somewhat thinner texture. But besides having bracteate pedicels it differs in having an unexpanded torus and a much less aculeate ovary. The capsules of VAR. *Prattii* are unfortunately not yet ripe but they agree exactly with those of typical *M. sinuata* at a similar stage and are totally unlike those of *M. horridula* or *M. aculeata* at any stage.

§ 2. Robustæ. *Tall often branching; stems, leaves and sepals hirsute or pubescent; ovaries setose; stigma capitate; leaves pinnatifid to -partite, radical many withering, cauline numerous all scattered; flowers Papaveroid, i.e., with 4 petals.*

4. (4.) MECONOPSIS ROBUSTA H. f. & T. *Flor. Ind.* 253 (1855); tall, glaucescent, glabrous or sparsely crinite with soft flexuous spreading hairs, leaves pinnatifidly lobed, lobes rounded acute, tips of peduncles and sepals sparsely patentlly crinite; cymes simple, flowers sulphur yellow, margins of petals crenulate; capsule obovate-oblong 8-11-valved, sparingly covered with adpressed sub-deciduous setæ. *Walp. Ann.* iv. 171 (1857). *M. nipalensis* Hook. f. *Bot. Mag.* t. 5585 (1866) nec DC. et via H. f. & T. *Flor. Ind.* & *Flor. Brit. Ind.* *M. robusta* H. f. & T. *Flor. Brit. Ind.* i. 118 (1872) in part; excluding the Nepal plant and the citation Wall. Cat. 8121. *Argemone mexicana* Wall. Cat. 8126 E (1830) nec Linn. Wall. Cat. n. 8124!

WESTERN HIMALAYA: Kamaon, 8-10,000 ft. *Blinkworth* in Wall. Cat. n. 8124! 8126 E! and in a third specimen without number in the Wallichian type herbm.! Nanik, *Strachey and Winterbottom!* Chenab Valley, *Stewart!* *Ellis* n. 1362! 1471! near Mussoorie, *King!* Pindi, *Collett!* Palang Gadh, Byaus; above Ramri; and Galmar, 10-12,000 ft., *Duthie!*

Stems simple or branched 4-6 ft high almost 2 in. thick at base; cymes lax-fl'd. 1-2 ft. long, flowers 2-3 in. across; sepals  $\frac{1}{2}$  in.; styles thickened at base  $\frac{1}{2}$  in long; capsule, including style,  $1\frac{1}{2}$  in.

This species, apparently strictly confined to Kamaon though not at all uncommon there, is perhaps only a geographical form, certainly is the western representative of the next species, from which it only differs in the want of fine pubescence intermingled with its long hairs, in the somewhat different lobulation of its leaves and in the margins of its petals being crenulate. In the *Flora Indica* Hooker and Thomson have cited only the Kamaon locality and only Wallich's n. 8124, and 8126, both of which came from that province, for their species. The description given, however, of the capsule applies rather to Wallich's n. 8121 from Nepal which is cited as equivalent to n. 8124, in the *Flora of British India*, where the locality Nepal is also given for the species. But the plant thus included (Wall. Cat. n. 8121) is not the same as the Kamaon one; it is the true *M. nepalensis* of DC. [*Prodr.* i. 121]—the crimson-flowered portion of *Stylophorum paniculatum* of G. Don [*Gen. Syst.* i. 135]—and is not distinguishable from the *M. Wallichii* VAR

*rubrofusca* of Bot. Mag. t. 6760. This plant agrees with *M. robusta* in having hirsute, but not tomentose, stems, leaves and sepals, but differs in having dark-red instead of yellow flowers and in having a narrower capsule with reddish spreading instead of adpressed or ascending yellow setæ with about half the number of valves and with a longer style slender throughout.

5. (5.) *MECONOPSIS PANICULATA* Prain; tall stout hirsute with soft flexuous spreading hairs and densely clothed with a soft substellate golden-yellow or grey pubescence; leaves linear-oblong or oblanceolate sinuately lobed, lobes widely-triangular-toothed, cymes paniculate or simple; flowers yellow, margins of petals entire; capsule obovate-oblong 8-11-valved densely covered with ascending subpersistent setæ and with close stellate pubescence.

VAR. *typica*; cymes paniculate, pedicels subfastigiate branched longer than the leaves even in flower sepals sometimes only puberulous. *Papaver paniculatum* D. Don, *Prodr. Flor. Nep.* 197 (1825). *Stylophorum paniculatum* G. Don, *Gen. Syst.* i. 135 (1831) *in part only and as to the yellow-fl. plant cited.* *Meconopsis napaulensis* Walp. *Rep.* i. 110 (1842) *not of DC.* *Meconopsis Wallichii* H. f. & T. *Flor. Ind.* 254 (1855) Walp. *Ann.* iv. 171 (1857); H. f. & T. *Flor. Brit. Ind.* i. 119 (1872) *in part only and as to the citation* Wall. *Cat. n.* 8123/b; *not of Hook.* *Polychætia paniculata* Wall. *MSS.* in *Herb. Wall.* n. 8123/b.

NEPAL: Gossain Than; Wallich. n. 8.23/b! SIKKIM: Jongri, King's Collectors! Ling-tu, King's Collectors! Phalloot, 10,000 ft., King's Collectors! Lachung and Tankra, 11,000 ft., G. Gammie! BOOTAN: Tak-poo, Dungboo!

VAR. *elata*; cymes simple, pedicels usually solitary, sometimes 2 together, spreading; not or hardly longer than the leaves in flower, elongating and fasciculate in fruit. *Meconopsis nivalensis* H. f. & T. *Flor. Ind.* 253 (1855); Hook. f. *Ill. Him. Pl.* t. 9 (1855); Walp. *Ann.* iv. 171 (1857); H. f. & T. *Flor. Brit. Ind.* i. 118 (1872); *M. nepalensis* Lemaire, *Ill. Hort.* iii. 95 (1856) — *not M. napaulensis DC.* *M. Wollastonii Regei*, *Gartenfl.* xxv. 291 (1876) *name only.* Wall. *Cat. n.* 8123/a.

CENTRAL HIMALAYA: Wallich, n. 8123/a! SIKKIM: Lachen, Hooker! Natong, Dungboo! Patang-la, King! Jongri, King's Collectors! Singalalah, G. Gammie! Lachung, G. Gammie!

Stems sparingly branched or simple 3-5 feet high, 2-3 in. thick at base; radical and lower cauline leaves petioled 6-18 in. long; cymes lax-fl. 1-2 feet long conspicuous; sepals in VAR. *typica*  $\frac{1}{2}$ - $\frac{3}{4}$  in., in VAR. *elata* 1 in. long; flowers in VAR. *typica* 2 in., in VAR. *elata* 3 in. diam.; style thickened at base  $\frac{1}{2}$  in. long; capsule, including style,  $1\frac{1}{2}$ -2 in.

Except for the more branching habit, the smaller amount of gross pubescence and the smaller flowers in VAR. *typica* there is nothing to separate the two varieties which pass into each other by many intermediates and are only sustained here in order the more easily to explain the somewhat complex synonymy which has arisen

from the inadequacy of the material in European Herbaria. In some cases *VAR. typica* has only a close stellate pubescence and then remarkably resembles *M. Wallichii*, but even if the colour of the petals has not been noted the ovaries with 10-11-placentas and the 10-11-lobed stigma, or at a later stage the larger ovate 10-11-valved capsule with shorter style much thickened below and the altogether different pubescence of the capsule amply distinguish this from *M. Wallichii*.

That *Wall. Cat. n. 8123/b* is D. Don's *Papaver paniculatum* is made certain by the fact that Don has himself written this name on the type sheet of *Wall. Cat. n. 8123/b*, which moreover retains the original field ticket on which Wallich has written the MSS name *Polychætia paniculata*. D. Don has at the same time identified *n. 8123/b* with *Meconopsis napaulensis* DC.; this identification is quite erroneous; *Meconopsis napaulensis* forms the red-flowered portion of G. Don's *Stylophorum paniculatum* whereas D. Don's *Papaver paniculatum* forms the yellow-flowered portion of G. Don's *Stylophorum paniculatum*. Hooker and Thomson on the other hand have assigned the name *M. nipalensis* to *Wall. Cat. n. 8123/a*, and have referred *Wall. Cat. n. 8123/b* to *M. Wallichii* in this following Sir W. Hooker who does not however include Wallich's yellow-flowered Nepal plant in his description of the blue-flowered Sikkim one though he cites the sheet itself. Besides being both, as it now transpires, truly conspecific, neither of the portions of Wallich's *n. 8123* agrees at all well with the original description of *M. napaulensis*; that description applies alone among the Himalayan species, to *Wall. Cat. n. 8121* and a comparison of that number with the original *M. napaulensis* in Mr. C. de Candolle's "Prodromus Herbarium" shows them to be identical.

The precise locality of *Wall. Cat. n. 8123/a* is doubtful. The original field ticket is missing; in the *Lith. Cat.* list it stands as "Kamaon?" This citation is almost certainly wrong; for the species does not occur amongst the plants sent by Blinkworth from Kamaon, and no collector has found it in Kamaon since Blinkworth's time. In all probability, *Wall. Cat. n. 8123/a*, like *n. 8123/b*, came from Nepal.

6. (—) *MECONOPSIS SUPERBA* King; tall stout hirsute with soft flexuous spreading hairs and densely clothed with soft grey pubescence; leaves obovate oblong serrate; cymes simple; flowers white margins of petals entire; ovary globose 7-11-valved densely clothed with adpressed setæ and with close stellate pubescence.

BOOTAN: Ho-Ko-Chu, *Dungboo*!

Stems simple, apparently 6 ft. high,  $1\frac{1}{2}$  in. thick within 2 feet of top; cauline leaves sessile amplexicaul 10-20 in. long; cymes rather dense-fl'd, pedicels 2-3 in each axil; sepals  $1\frac{1}{2}$  in. long; flowers nearly 4 in. diam.

This very fine plant is perhaps only a form of *M. paniculata* *VAR. elata*; the chief differences are the larger size of all its parts, the white, not yellow, petals and the serrate but not lobed cauline leaves. The ovary is exactly like that of *M. paniculata*; ripe fruit is as yet unknown.

7. (—) *MECONOPSIS NAPAULENSIS* DC. *Prodr. i. 121* (1824); tall glaucescent sparsely hirsute with soft flexuous spreading hairs rarely also thinly substellately pubescent, leaves lobed pinnatifid or lyrate-pinnatisect lobes rounded-oblong widely crenate-dentate; cymes simple or paniculate, tips of peduncles and sepals patently hirsute,



flowers dark fuscous-purple, capsules subcylindric or narrowly ovate 4-6-valved, densely covered with harsh setæ at first yellow and adpressed at length rufous and spreading or subreflexed. *Meconopsis robusta* H. f. & T. *Flor. Brit. Ind.* i. 118 (1872) in part and as to the Nepal plant cited (Wall. Cat. n. 8121) not of H. f. & T. in *Flor. Ind.* M. *Wallichii* VAR. *rubrofusca* Hook. f. *Bot. Mag.* t. 6760 (1884). *Stylophorum nepalense* Spreng. *Syst.* iv. cur. post. 203 (1827). *S. paniculatum* G. Don, *Gen. Syst.* i. 135 (1831) in part only and as to the crimson-fl. plant cited.

NEPAL: Gossain Than, Wallich n. 8121! Thari, in Eastern Nepal, King's Collectors! SIKKIM: Tehni-Zen King's Collectors! Tiamphung and elsewhere in Jongri, frequent, King's Collectors!

Stems simple 2-5 feet high,  $\frac{1}{2}$ -1 in. thick at base; flowers nodding, 3 in. in diam.; lower cauline leaves long-petioled; sepals rather densely crinite but not or sparsely stellate-pubescent; petals broadly obovate-oblong; capsules  $\frac{1}{2}$ -1 in. with a slender style  $\frac{1}{2}$ - $\frac{3}{4}$  in. long.

The bibliographical relationship of this species to *M. robusta* and *M. paniculata* has been already explained. From both it is readily distinguished by its dark purple not yellow flowers, by its smaller capsule with fewer valves and very different setæ, and by its much longer slender style. Its association with *M. robusta* has been due to both having rounded lobes of leaves and to the two having very similar sepals. Its identification with *M. paniculata* has been the result of a misapprehension on the part of Mr. D. Don who, of the two *Meconopsis* collected by Wallich in Nepal, has, contrary to M. de Candolle's explicit statement, selected the many-valved one as the equivalent of the *Prodromus* species. Mr. G. Don has attempted to overcome the difficulty thus created by treating these two Nepal plants, the red and the yellow-fl., as conspecific. This is however impossible for the botanical relationship of *M. napaulensis* is, as Sir Joseph Hooker has clearly shown, in the most recent notice of this species (*Bot. Mag.* t. 6760), with *M. Wallichii*. It has many of the characters of that plant but besides having dark-red, in place of pale-blue-purple flowers it is easily distinguished by its leaves and sepals being patently crinite with long hairs and by having very little, usually indeed none, of the close stellate pubescence that characterises the leaves and sepals of *M. Wallichii* where on the other hand there are none of the long hairs of *M. napaulensis*. This species has only recently been successfully introduced into European Gardens, plants having been reared by Mr. G. Wilson in his garden at Weybridge from seeds sent by Dr. King. It may ultimately be satisfactorily proved that Sir Joseph Hooker's suspicion, which the writer shares, that this and *M. Wallichii* are only forms of one species, is correct. In that case the name *M. Wallichii* which has become familiar in European horticulture will have to give way to the older name *M. napaulensis*, which is at present, but quite erroneously, associated in European gardens with Wallich's yellow-fl. species. In the meantime however it is more satisfactory and less misleading to treat *M. napaulensis* and *M. Wallichii* as specifically distinct.

8. (6.) *MECONOPSIS WALLICHII* Hook. *Bot. Mag.* t. 4668 (1852); *Jard. Fleur.* iii. t. 315 (1853); *Belg. Hort.* iv. t. 18 (1854); *Flore des*



*Serres*, viii. t. 735 (1855); *H. f. & T. Flor. Ind.* 254 (1855); *Walp. Ann.* iv. 171 (1857); *H. f. & T. Flor. Brit. Ind.* i. 119 (1872) *excluding in all cases the citation* Wall. Cat. 8123/b *and the Nepal locality.*

This is the pale-blue-fl. paniculate "Poppy" familiar to all travellers in Sikkim. Dr. King's Collectors have brought it also from Chumbi (Sham-Chen) and Dr. Cummins has sent specimens to Calcutta from Bootan (Dichu Valley) but though it thus extends further to the east than the *F. B. I.* indicates it has not as yet been collected in Nepal. The plant has long been cultivated in Europe, seeds having first been sent home by Sir Joseph Hooker in 1848 and plants having been reared at Kew by Sir William Hooker who figured and described the species. Sir William identified with this the paniculate form of Dr. Wallich's yellow-flowered Nepalese species which is often remarkably like this pale-purple-fl. plant, until ripe fruit is obtained. There is however no possibility of confounding the capsules of the two—those of *M. Wallichii* are smaller and narrower with 5-6 valves, with spreading rufous setae and a longer slender style; the yellow-fl. plant has longer widely-ovate capsules with 8-11 valves, setae that are less patent and that remain yellow throughout and a shorter style much thickened at the base. One result of the identification of these two plants has been that the *Meconopsis* named in Dr. Wallich's memory is one that he never collected or distributed.

§ 3. *Primulinæ.* *Stems very short simple, leaves and sepals glabrescent; ovaries glabrous (in a Chinese species strigose at apex); stigmas cleft or 2-lobed; leaves simple entire, radical few vanishing, cauline numerous close-set and pseudo-radical; flowers Sanguinarioid i. e. with 6-9 petals.*

9. (—) *MECONOPSIS PRIMULINA* Prain; almost glabrous, stem short leafy at the base only, leaves linear-oblong entire acute, radical few spatulate, all narrowed into short petioles and very sparsely strigose on both surfaces flowers on a terminal and one to two axillary scapes pendulous dark violet-purple; sepals 2 glabrous, petals 6-8 imbricate narrowly ovate with a distinct claw; stamens about 50, filaments filiform as long as the ovary, anthers orbicular-ovate golden-yellow; ovary glabrous 4-carpelled narrowly ovate tapering into a slender style  $\frac{1}{3}$  as long; stigmas 2-partite lobes oblong plano-convex, outer convex surface 2-stigmatic.

BOOTAN: Do-lep, *King's Collectors*! CHUMBI: Sham-Chen, *Dungboo*!

Rootstock fusiform 1-4 in. long, neck clothed with old sheaths; leaves  $1\frac{1}{2}$ - $2\frac{1}{2}$  in. by  $\frac{1}{4}$  in.; central scape 7 in., lateral 3-4 in.; sepals  $\frac{1}{2}$  in., petals  $\frac{3}{4}$  in. long,  $\frac{1}{4}$ - $\frac{1}{2}$  in. wide, inner narrower; filaments of the outer series often united into petaloid phyllomes with antheriferous fringe; ovary  $\frac{5}{8}$  in. long,  $\frac{3}{16}$  in. wide, placentas far intruded and passing up the substance of the style as 2 pairs of approximated traces, each trace bearing at the base of the style a projecting papilla laterally inclined so that the 4 papillæ are in 2 pairs alternate with placental traces and style lobes and opposite the stigmatic cleft, outer stigmatic loops alternate with placentas. The capsules though apparently full-grown are unripe.

The nearest ally of this species is *Meconopsis Henrici*, Franchet [*Journ. de*

*Botanique* v. 19 (1891,] from Szechuen which has more numerous leaves, also close-set on a short stem and not truly radical, more numerous stouter scapes and rather larger flowers that though nodding in bud are not nodding when full-blown. *M. Henrici* has however a very different ovary which is depressed globose, strigose in its upper half and considerably shorter than the style. In *M. Franchet's* species the same peculiar grouping of the filaments of the outer series in flat phalanges is also sometimes met with but there are no epanlettes of papillæ on the capsule. Another species in which the leaves and stems are exactly like those of *M. primulina* is *Meconopsis lancifolia* Franchet, from Yunnan. This has a glabrous ovary and short style and except in wanting the epanlettes and having a less deeply lobed stigma hardly differs from *M. primulina*. The flowers too are almost identical but instead of having a few flowers on long scapes, it has numerous flowers arranged in a racemose cyme with the pedicels bractless as in *M. horridula* var. *racemosa*, while the sepals are slightly and the stem and pedicels are rather densely strigose.

Another Yunnan species of this group is *Meconopsis Delavayi* Franchet, of which the flowers are exactly as in *M. lancifolia*, *M. Henrici* and *M. primulina* but which has solitary scapes and crowded very long-petioled pseudo-radical leaves with small spatulate-hastate blades.

§ 4. *Grandes*. Stemless or with simple stems, leaves and sepals softly hairy; ovaries hispid; stigmas large capitate ridged; leaves simple entire (in the Chinese) or dentate (in the Indian species), radical very numerous persisting, cauline, if present, few scattered below, whorled above; flowers Sanguinarioid i.e. with 5-8 petals.

10. (—) *MECONOPSIS GRANDIS* Prain; softly hairy, radical leaves tufted numerous ovate-lanceolate coarsely serrate, tapering into a long petiole; cauline leaves shortly petioled or sessile; flowers large very deep blue; ovary subcylindric sparingly covered with harsh spreading ultimately subdeciduous hairs; placentas 5, slightly intruded; style  $\frac{1}{3}$  the length of ovary; capsule linear-oblong.

SIKKIM: Jongri, in Western Sikkim, very common at 10-12,000 feet, *King's Collectors*! Watt n. 5435! *G. A. Gammie*!

Rootstock stout, clothed with sheaths, neck villous; radical leaves  $3\frac{1}{2}$ -7 in. by 1-2 in. with petioles 6-9 in. long; stem  $1\frac{1}{2}$ -3 ft. high leafy, leaves passing into bracts, the lower 1-3 scattered, the upper 3-5 collected in a whorl, lowest shortly petioled vacant, the next 1-2 with axillary flower-buds: bracts of the whorl subequal 5-6 in. by 3 in. with 1-2 axillary flowers; main axis terminating in a 1-fl. scape extending 6-18 in. beyond whorl; sepals 2 hairy, petals 5-7 imbricate, buds  $1\frac{1}{2}$  in., flowers 5 in. diam.; stamens  $\infty$ ; capsules  $2\frac{1}{2}$  in. long, seeds rugose.

This one of the finest species of *Meconopsis* in the Himalayas, is evidently, in spite of its great difference of habit, very closely allied to *M. simplicifolia* with which it agrees in having tufted coarsely dentate radical leaves and of which it has exactly the capsules and the seeds. It is also nearly related to *Meconopsis integrifolia* Franchet [*Bull. Soc. Bot. Fr.* xxxiii. 359 (1836) et *Plant. Delavay* 41 (1889); *Maxim. Flor. Tangut.* i. 35 t. 9. f. 7-12 et t. 22. f. 23-25 (1889): *Cathecartia integrifolia* Maxim. *Bull. Ac. Imp. Petersb.* xxiii. 310 et *Mel. Biol.* ix. 713 (1876); *Forbes & Hemsl. Journ. Linn. Soc.* xxiii. (*Ind. Sinens.* i.) 34 (1886)] which agrees with *M. grandis* in having tufted radical leaves and in having a stem that, though

shorter, has also 1-2 scattered leaves below and a whorl of 5-8 bracts with 2-3 axillary as well as a terminal flower above, but which differs in having all the leaves entire, in having yellow in place of dark purple flowers, and in having a very short style with a rather larger stigma. Of the two, *M. integrifolia* is perhaps the more beautiful species; both must prove, when ultimately introduced, great acquisitions to European horticulture. *M. grandis* seems to be confined to the district of Jongri but is very plentiful there.

11. (—) *MECONOPSIS SIMPLICIFOLIA* Walp. *Rep.* i. 110 (1842); *H. f. & T. Flor. Ind.* 252 (1855); *Hook. f., Ill. Him. Pl.* t. 8 (1855); *Ill. Hortic.* iii. 114 (1856); *Walp. Ann.* iv. 170 (1857); *Flore des Serres* xiii. t. 1324 (1858); *Flor. Brit. Ind.* i. 118 (1872). *Papaver simplicifolium* D. Don, *Prodr. Fl. Nepal.* 196 (1825) *Stylophorum simplicifolium* Spreng. *Syst.* iv. cur. post. 203 (1827); *G. Don, Gen. Syst.* i. 135 (1831). *Wall. Cat.* n. 8125.

The species most nearly related to *M. simplicifolia* is *M. quintuplinervia* Regel [*Gartenfl.* (1876) 291, t. 880, f. b. c. § d.; *Maxim. Flor. Tangut.* 34. t. 23. f. 27 (1889)] from Northern Tibet and Kansu. *M. quintuplinervia* differs from the Himalayan species in having entire leaves, filaments sub-2-seriate those of the outer rather shorter series being moreover slightly dilated upwards. A second closely allied species is *M. punicea* Maxim. [*Flor. Tangut.* 34. t. 23. f. 12-21 (1889)] which also differs from *M. simplicifolia* in having entire leaves but is further easily distinguished from both *M. simplicifolia* and *M. quintuplinervia* by having much longer and narrower petals and by having a short globose ovary with a much larger almost sessile stigma.

§ 5. Bellæ. *Stemless; scapes, leaves, sepals and ovaries glabrous, stigmas small capitate; leaves 2-3-pinnatifid all radical numerous persisting, flowers sub-Papaveroid, i.e. petals 4 or 5.*

12. (—) *MECONOPSIS BELLA* Prain, *Journ. As. Soc. Beng.* lxiii., pt. 2, 82 [*Noviciæ Indicæ* vii. 71] (1894).

This species is, as already mentioned in this work, very distinct from any hitherto reported *Meconopsis* and represents a group not very closely related to any of the preceding. This also, when ultimately introduced, must prove a great acquisition to European horticulture.

#### 4. (—) *RŒMÉRĪA* MEDIK.

Annual herbs with yellow juice; leaves petioled pinnatifid with multifid lobes; flowers in cymes, on slender leaf-opposed pedicels; sepals 2, petals 4 violet-purple, with a dark basal eye; stamens numerous; ovary linear, stigmas 2-4-lobed sessile; rays opposite the many-ovuled placentas. *Capsules* elongated, 3-4-valved, 1-locular, dehiscing throughout their length; seeds scrobiculate, without crests. Species 2; Mediterranean and Oriental.

#### *Key to the Indian Species.*

\* Capsule uniform, setose; filaments filiform ... 1. *R. hybrida*.

\*\* Capsule narrowed upwards, glabrous; filaments dilated 2. *R. refracta*.



The area occupied by *Rœmeria* is the conjoined Mediterranean and Oriental regions so that only the merest fringe of their area comes within the limits of the Indian Empire. Like *Papaver* therefore *Rœmeria* is not really an Indian genus. The nearest natural allies of its species are the prickly-capsuled members of *Papaver* § *Rhœades* from which they only differ in having valves that dehisce throughout instead of by pores. By this character *Rœmeria* approaches *Cathcartia* and that so closely that, as originally defined, *Cathcartia* differs only from *Rœmeria* in having crested seeds and differently coloured flowers. A new *Cathcartia* from Sikkim, however, agrees with *Rœmeria* in both characters; but for the presence of a style, not admitted in the original definition, in the species of *Cathcartia*, that genus must have been merged in *Rœmeria* from which it therefore only differs by the character that separates *Meconopsis* from *Papaver*. The place usually assigned to *Rœmeria* in taxonomic works is close to *Chelidonium* and *Glaucium*; the arrangement is neither natural nor convenient.

1. *Rœmeria hybrida* DC. *Syst. Veg.* ii. 92 (1821); leaves pinnatifid to -sect; filaments subulate; capsule uniformly patently setose.

VAR. *eriocarpa* DC. *Syst.* ii. 93 (1821); leaf segments oval oblong, flowers small. *R. pinnatifida* Boivin in *Belang. Voy. Ic.* t. 2 (1838). *R. orientalis* Boiss. *Ann. Sc. Nat.* ser. ii. xvi. 374 (1841); *Flor. Orient.* i. 118 (1867). *R. Schimperii* Presl., *Bot. Bemerk.* 8 (1843). *R. hybrida* var.  $\delta$ . *H. f. & T. Flor. Ind.* 257 (1855); *Walp Ann.* iv. 174 (1857).

NORTH-WEST FRONTIER: British Beluchistan; *Hamilton! Duke! Duthie! Lace!* DISTRIB. (of species) Westward to Spain: (of variety) Beluchistan, Afghanistan and Persia to Egypt.

Flowers 1 in. in diam. Capsules 1-2 in. long more or less copiously setose alike on placental ribs and valves. The variety hardly differs from the typical *R. hybrida*, which in the true Mediterranean region is itself very variable, except in the shape of the leaf segments and the smaller size of flowers and fruit.

All the specimens from British territory belong to this variety, which Boissier and others treat as a species. If so dealt with it should however be noted that the oldest name is not Boissier's one of *R. orientalis*, but Belanger's one of *R. pinnatifida*. The oldest name for the species as a whole is *R. violacea* Medik [*Ust. Ann.* iii. 15 (1792)] but that employed by DeCandolle being in more general use I have continued its employment.

2. *Rœmeria refracta* DC. *Syst. Veg.* ii. 93 (1821); leaves 2-pinnatifid segments linear; flowers large filaments dilated; capsule narrowed at the tip, glabrous. *Delessert, Icon. Select.* iii. t. 8 (1823); DC. *Prodr.* i. 122 (1824). *R. rhœodiflora* Boiss. *Diagn.* ser. i. vi. 7 (1845); *Flor. Orient.* i. 119 (1867). *R. hybrida* vars.  $\beta$ .  $\gamma$ . *H. f. & T. Flor. Ind.* 257 (1855); *Walp. Ann.* iv. 174 (1857).

NORTH WEST HIMALAYA: Badakshan, *Giles!* DISTRIB. Afghanistan, Beluchistan, Turkestan, Persia, Armenia.

Flowers 2 in. in diam. Capsules 1-2 in. long, without setae on the valves, sometimes with a few along the placental ribs.



When M. Boissier in 1845 first defined *R. rhæadiflora* he considered it a species apart from *R. refracta*; the only character, however, by which he could diagnose his species was that its pedicels did not turn down. There is however no character to separate the two and M. Boissier admits this when in the *Flora Orientalis* he includes under *R. rhæadiflora* the solitary gathering (Derbent, Steven!) on which the species *R. refracta* was founded! By an oversight, however, he omits to cite the name that DeCandolle had already given to the specimens of this gathering, or to merge his own later name in it. The writer, who has examined both Steven's, and therefore DeCandolle's, as well as Boissier's original specimens is satisfied that Boissier is right in considering the two conspecific. And a note by Stocks, on the specimen in Herb. Calcutta of the gathering from Beluchistan identified by Boissier with *R. rhæadiflora*, shows that that botanist had already recognised the identity of Boissier's species with *R. refracta* DC.

### 5. (—.) GLAUCIUM TOURNEF.

Biennial or perennial glaucous herbs with yellow juice. Radical leaves rosulate petioled, cauline more or less amplexicaul incised or lobed. Peduncles axillary or terminal 1-fl'd. Sepals 2; petals 4, orange-yellow convolute, stamens numerous; ovary linear; stigma 2-lamellate sessile, lamellae erect, alternate with the placentas and projecting at each end so as to form conjointly two horizontal arms stigmatic above, opposite the placentas. Capsule a slender cylindric pseudo-silique, valves delhiscent throughout their length and leaving a pseudo-replum resulting from union of margins of intruded placentae, in which the seeds are semi-immersed. Seeds scorbiculate without crests. Species about 15; throughout the Mediterranean, Oriental and Central Asian regions.

#### *Key to the Indian Species.*

- \* Pods slender, not much thicker than peduncles, slightly tortuose, contorted or irregularly curved, rarely straight 1. *G. elegans*.
- \* \* Pods stout, nearly twice as thick as peduncles, not tortuose, straight or only slightly regularly bent ... 2. *G. squamigerum*.

Like *Romeria* and *Papaver*, *Glaucium* is not a truly Indian genus. The difficulty of distinguishing satisfactorily the different forms has led in various taxonomic works to a great diversity of treatment. In the *Flora Orientalis* M. Boissier has distinguished thirteen *Oriental* species; in *Acta Hort. Petrop.* (1887) Dr. Kuntze has proposed the extreme measure of reducing all the forms to one very variable species *Glaucium corniculatum*. Doubtless the truth lies somewhere between these two extremes. M. Boissier was an author of the greatest care and of the highest judgment and the various forms that he describes are at all events recognisable. And though it is possible to some extent to justify the view of Dr. Kuntze when the genus is looked at from the monographer's stand point, it is not necessary or advisable to adopt it when dealing with the flora of a given area. Besides, an examination of Kuntze's work does not leave the impression that he appreciates the value, even for varietal differentiation, of the characters exhibited by the varieties and sub-

varieties which he recognises. Kuntze's later proposal, that the name *Glaucium*, owing to its similarity to the name *Glaux* (*Primulaceæ*), must give place to another, is mere pedantic trifling with a subject that has some claim to serious treatment.

1. *GLAUCIUM ELEGANS* Fisch. & Mey. *Ind. Sem. Hort. Petrop.* i. 29 (1835); glabrescent, radical leaves obovate-oblong pinnatifid, lobes shortly ovate creately toothed; cauline cordate-amplexicaul broadly ovate obtusely toothed; sepals papillose, petals small orange with red eye; capsule slender, torulose, often contorted, sparingly setose with spreading prickles, seeds oblong-cylindric curved. *H. f. & T., Flor. Ind.* 255 (1855); *Boiss. Flor. Orient.* i. 120 (1867). *G. pumilum* Boiss. *Ann. Sc. Nat. ser. ii.* xvi. 374 (1841). *G. squamigerum* Bunge, *Rel. Bot. Lehm.* 192 (1847); *Boiss. & Buhse, Aufzähl.* (1860); *nec* Kar. & Kir.

NORTH-WEST FRONTIER: Kohat, at Mirkhorli, *Drummond!*  
DISTRIB. Afghanistan, Turkestan, and N. Persia to Armenia.

Stems 1 ft. or higher, slender much branched, radical leaves  $1\frac{1}{2}$ –2 in., sepals  $\frac{1}{2}$  in. long, buds  $\frac{1}{2}$  in. diam.; flowers 1 in. diam.; capsule usually twisted 2–3 in. long, narrowed (subtorulose) between the seeds.

2. *GLAUCIUM SQUAMIGERUM* Kar. & Kir. *Bull. Soc. Mosc.* xv. 141 (1842); glabrescent, radical leaves lyrate-pinnatifid, lobes ovate wide toothed, terminal subquadrate; cauline cordate-amplexicaul, broadly oblong acutely lobed; sepals glabrous, petals orange-yellow; capsule straight or curved, sparsely setose; seeds reniform deeply pitted. *Regel & Herd. Bull. Soc. Mosc.* xxxvii. 406 (1864). *G. persicum* Bunge, *Rel. Bot. Lehm.* 192 (1847) *nec* DC. *G. corniculatum* H. f. & T. *Flor. Ind.* 256 (1855) *nec* Linn. *G. luteum* var. *fimbrillifera* Trautv. *Bull. Soc. Mosc.* xxxiii. 92 (1860). *G. fimbrilligerum* Boiss. *Flor. Orient.* i. 120 (1867).

NORTH-WEST HIMALAYA: Badakshan, *Giles!* N.-W. FRONTIER: Kach, *Lace!* Nal, *Duke!* DISTRIB. Beluchistan, Afghanistan, Turkestan, Soongaria.

Stems 1 ft. or higher, branching; radical leaves, 2–6 in., sepals  $\frac{3}{4}$  in. long, buds  $\frac{1}{4}$  in. or less in diam.; flowers  $1\frac{1}{2}$ –2 in. diam., petals bright yellow (*Aitchison*); capsule usually slightly curved, 6–8 in. long; adpressed aculeate, flattened (scale-like) setae ultimately suberect.

*Glaucium elegans* is perhaps one of the most distinct of the forms in this troublesome genus where all the forms are somewhat variable and seem to pass one into the other. *G. squamigerum*, on the other hand, is, so far as Afghan and Beluch specimens are concerned, most like *G. arabicum* Fresen. from Sinai, which in turn much resembles and is perhaps only a geographical form of *G. corniculatum*. As represented in Herb. Kew, Herb. Boissier and Herb. DC., *G. fimbrilligerum* Boiss. and *G. squamigerum* Kar. & Kir. would appear to be specifically separable but a fine suite of specimens from Turkestan in Herb. Paris shows that they pass into each other and that it is not possible to separate them even varietally.

## 6. (3.) CATHCARTIA HOOK. F.

*Key to the Indian species (incorporating the new forms).*

- \* Stigma large, style very short; flowers large, stamens numerous (32); a softly hairy plant with (cordate lobed leaves and) rounded yellow petals ... 1. *C. villosa*.
- \* \* Stigma small, style distinct, flowers small, stamens definite (16); glabrescent herbs with narrow pale-purple petals:—
  - † Leaves hastate-entire to lyrate-pinnatifid; petals ovate-lanceolate, obtuse, apex subfimbriate ... 2. *C. lyrata*.
  - † † Leaves ovate-lanceolate; petals lanceolate, acute, apex entire ... 3. *C. polygonoides*.

A purely E. Himalayan genus only separable from *Meconopsis* by the character of capsule dehiscing by valves from apex to base. As originally described the genus was supposed to have no style. There is however even in the original species a distinct, though short, style.

1. CATHCARTIA VILLOSA Hook. f. *Bot. Mag.* t. 4596 (1851); *Flore des Serres* vii. t. 636 (1851); *Lemaire, Jard. Fleur.* ii. t. 167 (1852); *H. f. & T., Flor. Ind.* 254 (1855); *H. f., Ill. Him. Pl. frontisp.* (1855); *Walp. Ann.* iv. 175 (1857); *H. f. & T., Flor. Brit. Ind.* i. 119 (1872.)

This has been obtained in Eastern Nepal as well as in Sikkim by Dr. King's Calcutta collectors.

2. CATHCARTIA LYRATA Cummins & Prain; glabrescent, rootstock slender clothed with sheaths; stem slender glabrous; radical leaves few early withering, cauline 3-4 from hastate-entire to lyrate-pinnatifid sparingly hirsute on both surfaces; flowers small, blue, solitary or in few-fl. cymes; style distinct; stigma small 2-3-lobed; seeds smooth without crests.

SIKKIM HIMALAYA; 13-14000 feet, not common; Ta-ne-da King! Chiani, Phallut, and Jongri, *King's Collectors!* Tankra, G. Gammie! near Gnatong, H. A. Cummins!

*Stem* 3-10 in. simple or sparingly branched; *leaves*  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. by  $\frac{1}{4}$ - $\frac{3}{4}$  in., radical disappearing, cauline petioles  $\frac{1}{2}$ -1 $\frac{1}{2}$  in. *Flowers* 1-3 (usually solitary), *sepals* glabrous, buds  $\frac{1}{4}$  in. diam. nodding; full blown flowers 1 in. diam.; pedicels very slender, petals narrowly to widely lanceolate rounded or obtuse rarely acute always fimbriate at the margin. *Stamens* 16, in 2 rows of 8 each; *placentas* 2-3, distinctly intruded. *Capsules* 1 $\frac{1}{2}$  in. long, very slender, erect, valves membranous.

The complete elaboration of this interesting little species which has puzzled Indian botanists since 1877 when it was first obtained by Dr. King, is largely due to the efforts of Surgn.-Capt. Cummins of the Medl. Staff who met with it when stationed at Gnatong in 1893, and who has assisted the writer in preparing a description. The ripe fruits show that it is undoubtedly a *Cathcartia*; the valves dehisce to the base while the stigmatic rays are opposite the placentas. It differs however from the original *Cathcartia villosa* in having ripe seeds without a crested raphe, in having a distinct style, and a much smaller stigma. It must prove

a welcome addition to western horticulture when its seeds are at length introduced to Europe.

3. *CATHCARTIA POLYGONOIDES* Prain; glabrescent, rootstock slender clothed with sheaths; stems slender strigose; radical leaf solitary persisting long-petioled, cauline leaves 2-3, lower long-petioled uppermost sessile clasping, ovate-oblong obtuse base cuneate, truncate or slightly cordate, margins entire or slightly incised crenate, sparingly hairy on both surfaces; flowers small blueish-white; style distinct, stigma small 2-3-lobed.

CHUMBI: Sham-chen, *Dungboo*! Put-lo and Ling-moo-tong, *King's Collectors*!

Stem 6-15 in. simple; leaves  $1\frac{1}{2}$ -2 in. by  $\frac{1}{2}$ - $\frac{3}{4}$  in.; radical petioles 3 in., lower cauline petioles 1-4 in. long. Flowers solitary 1 in. diam. nodding, pedicels long slender; petals narrowly lanceolate apex acute margin entire; stamens 16 in 2 rows of 8 each; placentas 2-3.

The flowers and unripe capsules of this plant are so remarkably like those of *C. lyrata* that there would seem no room for doubt as to its generic position. But it is at the same time remarkably like a small form of a plant from Yunnan described by M. Franchet as *Meconopsis betonicaefolia* [*Plantae Delavayanae*, 42, t. 12 (1889)] of which it has all the habit and, though on a smaller scale, exactly the foliage. A final judgment on both *Cathcartia polygonoides* and *Meconopsis betonicaefolia* can therefore only be given when ripe fruit of both plants has been received. The specific differences between the two plants are the fewer (16) stamens in the Chumbi plant than in the Yunnan one, which has 64; the narrower much smaller petals; and the smaller ovary and stigma. As regards stigma *Meconopsis betonicaefolia* more nearly approaches *Cathcartia villosa*, but (like the two species now described) it has a long style; it has also more stamens (64 in 2 rows of 32 each in place of 32 in 2 rows of 16 each as in *C. villosa*). The ovary and unripe capsules of *Meconopsis betonicaefolia*, *Cathcartia lyrata* and *C. polygonoides* are remarkably similar; knowing that one of them is a *Cathcartia* the writer thinks it possible that the other two may eventually prove to be members of the same genus.

#### 7. (4.) CHELIDONTIUM TOURNEF.

Perennial glaucous herbs with yellow juice. Radical leaves petioled few erect or many rosulate, cauline few scattered, or 0, floral 0, or 2 terminal subopposed, or several near apex scattered. Flowers in fascicled or corymbose cymes. Sepals 2, petals 4, yellow or orange, convolute, stamens numerous, ovaries linear rarely ovate, 2-(rarely 3-4)-valved; style distinct stigma 2-lamellate lobes erect alternate with placentas, sinuses not projecting into arms. Capsule slender cylindric, rarely ovate, valves dehiscing throughout their length. Seeds shining smooth or opaque pitted, not scrobiculate, raphe crested. Species 9; 7 Chinese, of which 1 (*C. japonicum*) extends to Japan, another (*C. majus*) occurs also in Japan, Mongolia and Dahuria, extends westward to Britain and is naturalised in N. America; 1 North American; 1 Himalayan.



In the *Flora Indica* (1855) Sir J. D. Hooker and Dr. Thomson founded a genus *Dicranostigma* on the Indian species here dealt with. This species (*Dicranostigma lactucoides*) was however subsequently referred to *Stylophorum* by Mr. Benthams and Sir J. D. Hooker [*Gen. Pl.* i. 53 (1862)], by M. Baillon [*Hist.* iii. 114 (1871)] and again by Sir J. D. Hooker and Dr. Thomson [*Flor. Brit. Ind.* i. 119 (1872)]. More recently Messrs. Prantl and Kundig have suggested [*Engler, Natur. Pflanzenf.* iii. i. 139 (1891)] that *Dicranostigma* should rather be referred to *Hylomecon* Maxim. [*Prim. Fl. Amur.* 36, t. 3 (1858)] a genus founded on a plant that was originally [*Thunbg, Flor. Japon.* 221 (1784); *Sieb. & Zucc. Abh. Acad. Muench.* iv. ii. 169 (1846)] referred to *Chelidonium*, but that was at a later date [*Miquel, Prolus. Flor. Japon.* 199 (1867)] included in *Stylophorum*; this genus Mr. Prantl would reinstate. The view expressed by Prantl and Kundig is undoubtedly more tenable than that of the other authors quoted; at the same time if the method of limitation adopted by them be accepted it would be more advisable to retain *Dicranostigma* also as a genus. In any case the name of the conjoint genus suggested by Prantl and Kundig must be *Dicranostigma*, not *Hylomecon*. But the species in question, formerly very inadequately known, has been recently communicated by Mr. Duthie from Kamaon (its original locality) and by the collectors of the Calcutta garden from Phari in the Eastern Himalaya. A study of these specimens and of the material of the allied groups *Stylophorum* and *Hylomecon*, preserved in the national Herbaria at Kew and at the Jardin des Plantes, Paris, shows however that it is impossible to accord generic rank to any of them, or to separate them satisfactorily from each other or from *Chelidonium*. A detailed review of the species belonging to this widened *Chelidonium* will be found in the *Bulletin* of the Boissier Herbarium.

1. CHELIDONIUM DICRANOSTIGMA Prain. *Dicranostigma lactucoides* H. f. & T. *Flor. Ind.* 255 (1855); *Walp. Ann.* iv. 272 (1857). *Stylophorum lactucoides* Baill. *Hist. Pl.* iii. 114 (1871); *H. f. & T. Flor. Brit. Ind.* i. 119 (1872).

N.-W. HIMALAYA: Kamaon, *Strachey and Winterbottom* n. 3! *Duthie* nn. 2699! 3819! 5326! EASTN. HIMALAYA: Phari, *King's Collector*!

Nearly allied to *Chelidonium Franchetianum* Prain [in *Bull. Herb. Boiss. ined.*] and *C. leptopodum* Prain [*Glaucium leptopodum* Maxim. *Mel. Biol.* ix. 714 (1876)], which belong equally to the section *Dicranostigma*. From both it differs in having large stigmatic lobes, softly hairy capsules, and simple cymes. The section to which these species belong differs from the remaining *Chelidonia* in having a glaucoid habit—i. e., radical leaves many rosulate, cauline 0, floral apical all scattered.